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PENSOFT

Checklist of the superfamily Noctuoidea (Insecta, Lepidoptera) from Tamil Nadu, Western Ghats, India

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Abstract

A checklist of the superfamily Noctuoidea (Erebidae, Noctuidae, Euteliidae, and Nolidae) from Nilgiris Biosphere Reserve and Kodaikanal Hills in Western Ghats, Tamil Nadu is presented. We collected noctuoid moths monthly from June 2010 to December 2014. We collected 9095 individuals (5242 males and 3853 females) belonging to 188 species, 106 genera, 5 subtribes, 25 tribes, 26 subfamilies and 4 families. The most species-rich families were Erebidae (106 species) and Noctuidae (51 species). The Erebinae was found to be the richest subfamily with 64 species. Additional sampling might reveal 2–3 times more species.

Key words

Lepidoptera; Noctuoidea; light trapping; Western Ghats; fauna.

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Introduction

Moths belonging to the order Lepidoptera are probably the largest group of phytophagous insects (Scoble 1992). They are one of the most-studied groups of organisms (Kristensen et al. 2007). The superfamily Noctuoidea (order Lepidoptera) comprises 43,000 described species which are classified into 3800 genera (Nieukerken et al. 2011), but there are still many undescribed species, mostly from tropical regions. The superfamily encompasses the families Oenosandridae, Notodontidae, Erebidae, Noctuidae, Euteliidae, and Nolidae. The larvae of many noctuoids are pests, typically associated with higher vascular plants, and collectively have a massive commercial impact annually (Kitching 1984), and adults of many noctuoid genera damage fruit crops by piercing the skins of fruits to suck juice (Banziger 1982). Approximately 6000 noctuoid species are known to be commercially important (Zang 1994). Noctuoids are well represented in all the major zoogeographic regions and in a wide variety of habitats. Entomologists believe that approximately 100,000 species may exist word wide, with over 70,000 species described and recorded so far (Kitching and Rawlins 1998).

India has diverse ecosystems and hosts 3 biodiversity hotspots, the Western Ghats, the Himalayas, and Indo-Burma region. The Nilgiri Biosphere Reserve, in the Western Ghats of South India, is one of the 18 biodiversity hotspots in the world. The Indian subcontinent has an abundant moth fauna, with 4438 species recorded by Cotes and Swinhoe (1887–1889) and 5277 species recorded by Hampson (1892–1896). Herein, we provide a checklist of species of noctuoid moths from the Western Ghats.

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Table 1. Sampling locations in the Nilgiri Biosphere, with geographic coordinates and elevation.

No.	Locality	Latitude (N)	Longitude (E)	Elevation (m)
1	Ooty Botanical Garden	11°41′75″	076°71′04″	2228
2	Benchmark Tea Estate	11°41′18″	076°72′07″	2389
3	Doddabetta	11°40′11″	076°73′58″	2624
4	Ooty Lake	11°40′45″	076°69′09″	2221
5	Coonoor Municipal Building	11°33′91″	076°80′17″	1686
6	Sim's Park	11°35′48″	076°80′03″	1855
7	Ketti	11°38′21″	076°73′74″	2137
8	Ithalar	11°34′27″	076°63′56″	2112
9	Emerald Dam	11°32′63″	076°61′99″	2009
10	Avalanche	11°30′01″	076°59′08″	2005
11	Kothagiri Pandian Park	11°42′15″	076°85′00″	1897

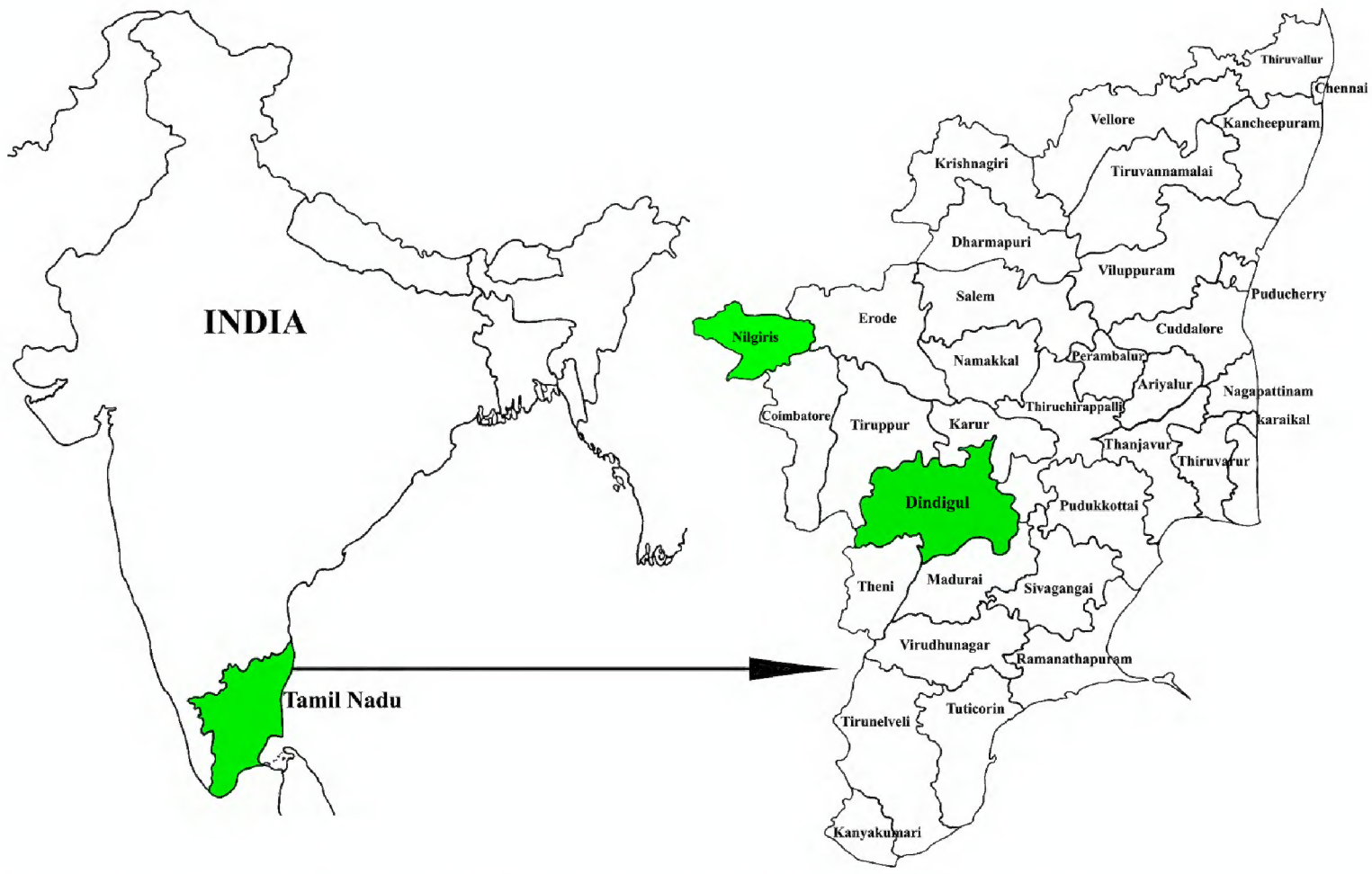


Figure 1. Maps showing locations of Nilgiri and Dindigul District in Tamil Nadu, India. Not to scale.

Methods

Study areas. The Nilgiri Hills, also known as the Blue Mountains, lie in the district of Nilgiris, Tamil Nadu, India. The Nilgri Hills are between 2280 and 2623 m. Coonoor is the second largest hill station in the Nilgiris with an elevation of 1,858 m above sea level. Kodaikanal hill station is situated in the Dindugul district, Tamil Nadu on the eastern side of the Western Ghats with an elevation of 2130 meters.

The noctuoid moths were collected using sweep nets from 25 different localities. The Ooty Botanical Garden, Benchmark Tea Estate, Doddabedda, Ooty Lake, Coonoor Municipal Building, Sim's Park, Ketti, Ithalar, Emerald Dam, Avalanche, and Kothagiri Pandian Park are located in the Nilgiri Biosphere Reserve (Table 1, Fig. 1) and Kodaikanal Bus Terminus, Perumalmalai (Site 1 and Site 2), Observatory, Poomparai, Pallangi, Mattupatti, Moonjikal, Bear Shola, Bryant Park, Coaker's Walk, Senbaganur, Vattakanal, and Vellagavi are located in the Kodaikanal area (Table 2, Fig. 2).

Sample collection and analysis. Specimens of noctuoid moths were collected from the Nilgiri Biosphere Reserve and Kodaikanal Hills from June 2010 to December 2014. We sampled in the morning (between 05:00 and 06:00 h) and in the night time (between 18:30 and 22:00 h) at each site for 5 consecutive days each month. Specimens were collected using sweep nets and a mercury vapour light trap (220/200 W light source). Except a few specimens for taxonomic studies, moths were released in the field. Moths were least abundant during December and January.

The specimens collected for taxonomic study were rinsed in ethyl acetate and mounted. They were subsequently vouchered in Entomology Research Institute, Loyola College, Chennai, India.

The nomenclature used followed Kononenko and Pinratana (2005, 2013) and Lafontaine and Schmidt (2010), except for the Catocalinae, which was based on the classification of Kitching (1984).

Results

In this study, 9095 individual moths (5242 males and 3853 females) of the superfamily Noctuoidea were collected. Included in this number are 188 species belonging

Table 2. Sampling locations in the Kodaikanal Hills, with geographic coordinates and elevation.

No.	Locality	Latitude (N)	Longitude (E)	Elevation (m)
1	Kodaikanal Bus terminus	10°23′53″	077°49′29″	2130
2	Perumal malai (site 1)	10°26′40″	077°53′36″	1563
3	Perumal malai (site 2)	10°27′04″	077°53′36″	1504
4	Observatory	10°22′91″	077°45′95″	2295
5	Poomparai	10°24′70″	077°40′04″	1926
6	Pallangi	10°27′32″	077°45′23″	1665
7	Mattupatti	10°27′37″	077°45′54″	1680
8	Moonjikal	10°23′91″	077°49′077″	2030
9	Bear Shola	10°24′00″	077°48′02″	2106
10	Bryant Park	10°23′09″	077°49′44″	2130
11	Coaker's walk	10°23′09″	077°49′44″	2130
12	Senbaganur	10°23′17″	077°50′03″	1798
13	Vattakanal	10° 21′52″	077° 48′52″	2080
14	Vellagavi	10° 19′70″	077°49′91″	1343

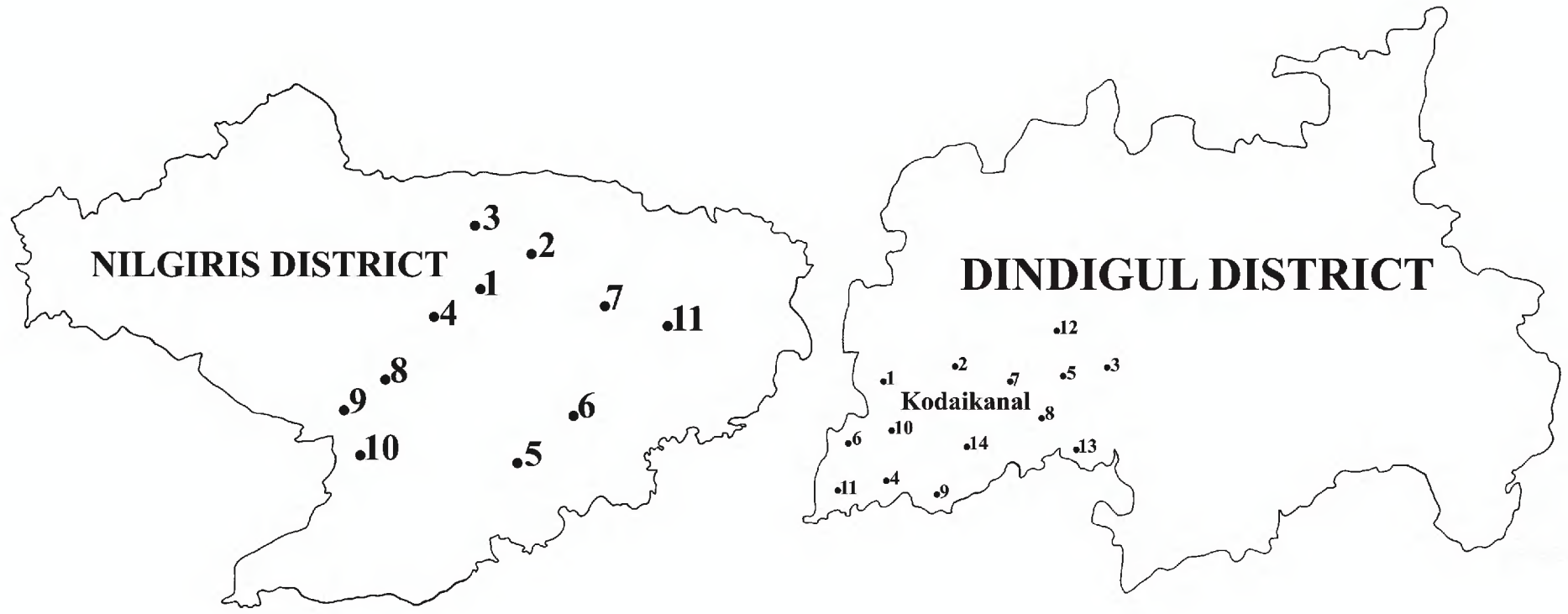


Figure 2. Maps showing the collection locations in Nilgiri and Kodaikanal (Dindigul District). Not to scale.

to 4 families, 26 subfamilies, 106 genera, 25 tribes, and 5 subtribes (Table 3).

We report here a preliminary checklist of Noctuoidea from Nilgiri Biosphere Reserve and Kodaikanal Hills in the Western Ghats, based on almost 5 years of study according to our analysis based on the body of literature (Holloway 1984, 1985, Park 2001, Holloway 2005, Kononenko and Pinratana 2005, 2013).

The most species-rich families were Erebidae (106 species; 56%), and Noctuidae (51 species; 27%) (Fig. 3). Erebinae was the most species-rich subfamily (66 species; 35.3%) followed by Calpinae (14 species 7.5%), Hadeninae (13 species; 7%), and Amphipyrinae (10 species; 5.3%). The genera of subfamily Catocalinae with the most species were: *Eudocima* (9 species), *Hypena* (8 species), *Mythimna* (6 species), *Hypocala* (6 species), *Bastilla* (5 species), *Penicillaria* (5 species), and *Blenina* (5 species).The most abundant species was *Oxyodes scrobiculata* (Fabricius, 1775) (1426 individuals), which constituted 15.7% of all samples. *Lacera noctilio* (Fabricus, 1794) was the second most abundant species (381 individuals), which constituted 4.1% of all samples. Both *O. scrobiculata* and *L. noctilio* were abundant throughout most of the study period. Greater numbers of noctuoids were recorded during April to May, and during September to November. It might be that the temperature during the monsoon season is more suitable for the development of noctuoid moths. *Savara pallidapex* Holloway, 2005 was recorded for the first time in the Western Ghats.

***Aegilia describens* (Walker, [1858])**

Lophoptera xylinata Walker, 1865: 920.
Stictoptera anisoptera Snellen, 1880: 88.
Stictoptera anca Swinhoe, 1919: 120.

Material examined. Table 3; Figure 54.

Remarks. This species was recorded by Holloway (2005) on the basis of survey from Borneo. This species is differentiated from other taxa mainly by characters of male and female genitalia. Externally it is similar to *A. sundascribens*.

***Aegilia sundascribens* Holloway, 1976**

Material examined. Table 3.

Remarks. It can be distinguished from *A. describens* based on sinuous forewing fasciae, and whitish submarginal line at the tornus.

***Gonitis mesogona* (Walker, 1858)**

Gonitis mesogona Walker 1858): 1002.
Anomis mesogona Walker—Holloway 1976: 37.

Table 3. Noctuoid moths collected from the Western Ghats, Tamil Nadu from June 2010 to December 2014. *First time record in Nilgiri Biosphere.

Taxon	No. of individuals		
	M	F	Total
Division Trifine			
Family Noctuidae Latreille, 1809			
Subfamily Noctuinae Latreille, 1809			
Tribe Agrotini Rambur, 1848			
Subtribe Agrotina Rambur, 1848			
Genus *Agrotis* Ochsenheimer, 1816			
Agrotis segetum ([Dannis & Schiffermuller], 1775)	49	63	112
Agrotis ipsilon (Hufnagel, 1776)	24	17	41
Genus *Protexarnis* McDunnough, 1929			
Protexarnis photophila (Guenée, 1852)	5	13	18
Genus *Polytela* Guenée, 1852			
Polytela florigera Guenée, 1852	69	41	110
Subtribe Austrandesiina Angulo & Olivares, 1960			
Genus *Peridroma* Hübner, 1821			
Peridroma saucia (Hübner, [1808])	18	7	25
Genus *Xestia* Hübner, 1818			
Xestia c-nigrum (Linnaeus, 1758)	63	47	110
Subfamily Acontiinae Guenée, 1841			
Genus *Eustrotia* Hübner, 1821			
Eustrotia marginata (Walker, 1866)	2	6	8
Genus *Erastroides* Hampson, 1893			
Erastroides sp.	2	2	4
Subfamily Hadeninae Guenée, 1852			
Genus *Aletia* Hübner, 1821			
Aletia consanguis (Guenée, 1842)	20	8	28
Genus *Polia* Boisduval, 1828			
Polia mediana (Moore, 1881)	5	7	12
Genus *Trachea* Ochsenheimer, 1816			
Trachea auriplena (Walker, 1857)	18	13	31
Tribe Leucanini Guenée, 1841			
Genus *Mythimna* Ochsenheimer, 1816			
Mythimna compta Moore, 1884	10	16	26
Mythimna irregularis Walker, 1857	11	8	19
Mythimna unipuncta Hawker, 1803	36	57	93
Mythimna sinuosa (Moore, 1882)	7	3	10
Mythimna l-album Linnaeus, 1776	28	43	71
Mythimna loreyi (Dupnochel, 1827)	8	8	16
Genus *Tiracola* Moore, 1881			
Tiracola aureata Holloway, 1989	4	9	13
Tiracola plagiata Walker, 1857	5	12	17
Subfamily Acronictinae Heineman, 1859			
Tribe Craniophorini Beck, 1996			
Genus *Craniophora* Snellen, 1867			
Craniophora fasciata (Moore, 1887)	22	13	35
Genus *Cryphia* Hübner, 1818			
Cryphia lichenea Hampson, 1893	5	2	7
Subfamily Amphipyrinae Guenée, 1838			
Tribe Actinotiini Beck, 1996			
Genus *Actinotia* Hübner, 1821			
Actinotia polyodon (Clerk, 1759)	43	29	72
Genus *Callopistria* Walker, 1858			
Callopistria repleta (Walker, [1858] 1857	9	12	21
Callopistria rivularis (Walker, [1858] 1857)	3	2	5
Callopistria maillardi (Guenée, 1862)	1	4	5
Genus *Sasunaga* Holloway, 1985			
Sasunaga tenebrosa (Moore, 1867)	52	38	90
Sasunaga longiplaga Warren, 1912	19	17	36
Sasunaga leucorina (Hampson, 1894)	12	3	15

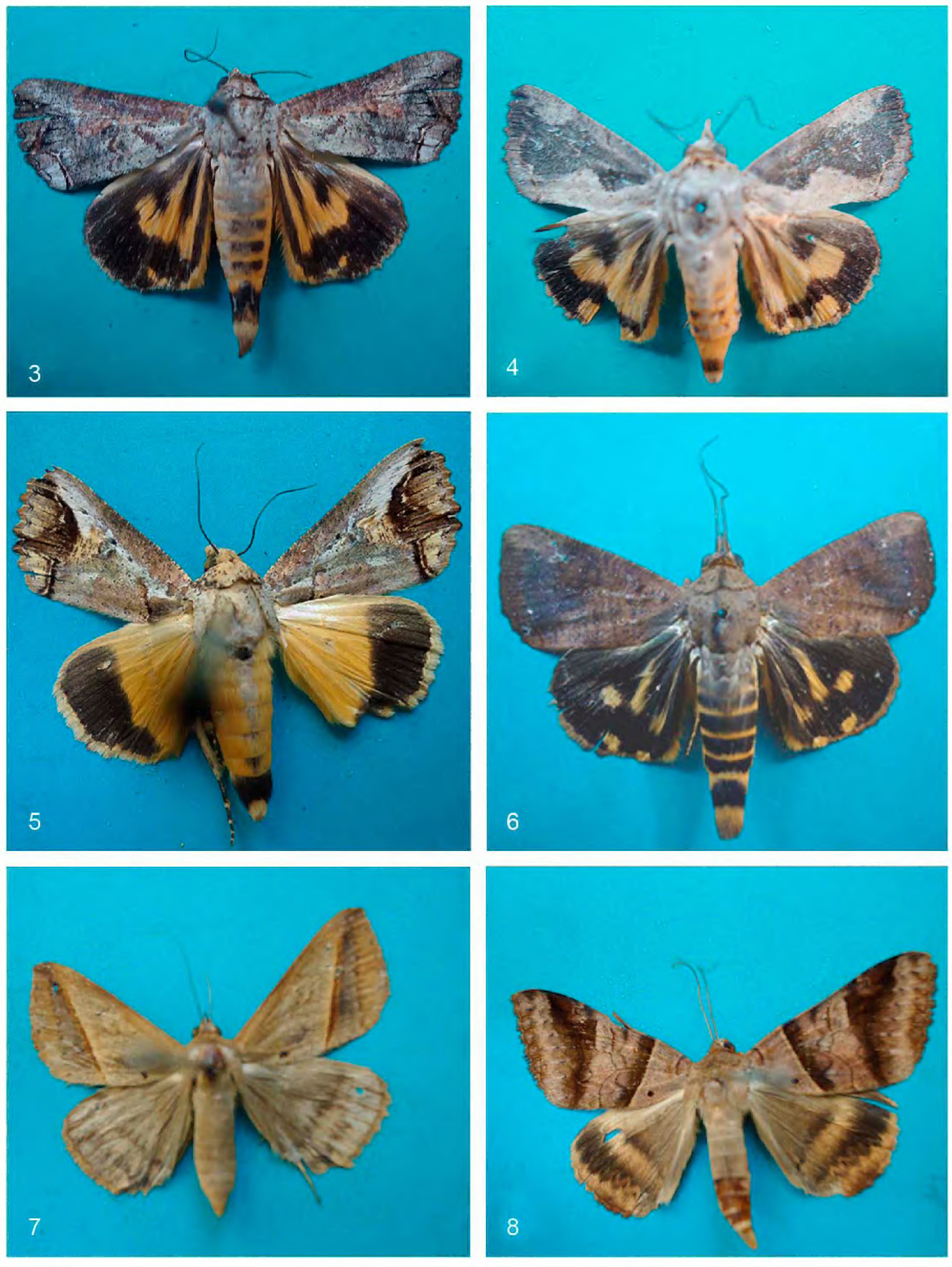
Taxon	No. of individuals		
	M	F	Total
Genus *Conservula* Grote, 1874			
Conservula indica (Moore, 1867)	78	25	103
Genus *Spodoptera* Guenée, 1852			
Spodoptera litura (Fabricius , 1775)	241	167	408
Spodoptera mauritia (Boisduval, 1833)	9	20	29
Subfamily Heliothinae Boisduval, 1828			
Genus *Helicoverpa* Hardwick, 1965			
Helicoverpa armigera (Hübner, [1808])	128	61	189
Subfamily Bagisarinae Crumb, 1956			
Genus *Chasmina* Walker, 1856			
Chasmina candida (Walker, 1865)	54	32	86
Genus *Raghuva* Moore, 1881			
Raghuva sp.	2	4	6
Subfamily Dyopsinae Guenée, 1852			
Genus *Arcte* Kollar, [1844]			
Arcte coerula (Guenée, 1852)	13	19	32
Subfamily Plusiinae Boisduval, 1829			
Tribe Argyrogrammatini (Eichlin & Cunningham, 1976)			
Genus *Agrapha* Hübner, [1821]			
Agrapha albostriata (Bremer & Grey, 1853)	40	27	67
Agrapha (*Agrapha*) *agnata* Staudinger, 1892	19	10	29
Agrapha (*Agrapha*) *limbirena* Guenée, 1852	74	39	113
Genus *Ctenoplusia* Dufay, 1970			
Ctenoplusia aeneofusa Hampson, 1894	37	67	104
Ctenoplusia sp.	9	4	13
Genus *Autoplusia* McDunnough, 1944			
Autoplusia sp.	3	1	4
Genus *Trichoplusia* McDunnough, 1944			
Trichoplusia orichalcea Fabricius, 1775	89	56	145
Trichoplusia dubae Boisduval, 1840	24	17	41
Genus *Syngrapha* Hübner, [1821]			
Syngrapha circumflexa Linnaeus, 1767	3	1	4
Genus *Odontodes* Guenée, 1852			
Odontodes aleuca Guenée, 1852	32	19	51
Genus *Lophotera* Guenée, 1852			
Lophotera squammigera Guenée, 1852	14	12	26
Lophotera squammilinea Guenée, 1852	15	12	27
Genus *Stictoptera* Guenée, 1852			
Stictoptera cuculloides Guenée, 1852	16	12	28
Stictoptera signifera (Walker, [1858] 1857)	14	12	26
Genus *Aegilia* Walker, [1858]			
Aegilia describens (Walker, [1858] 1857)	16	12	28
Aegila sundascribens Holloway, 1976	19	7	26
Family Erebidae Leach, [1815]			
Subfamily Scoliopteryginae Herrich-schaffer, [1851]			
Tribe Anomini Grote, 1882			
Genus *Anomis* Hübner, [1821]			
Gonitis mesogona (Walker [1858])	34	17	51
Rusicada privata (Walker, 1865)	42	23	65
Anomis flava (Fabricius, 1775)	24	12	36
Gonitis involuta (Walker, [1858])	27	32	59
Subfamily Calpinae Boisduval, 1840			
Tribe Calpini Boisduval, 1840			
Genus *Plusiodonta* Guenée, 1852			
Plusiodonta coelonota (Kollar, [1844])	48	20	68
Genus *Calyptra* Ochsenheimer, 1816			
Calyptra minuticornis (Guenée, 1852)	79	48	127
Genus *Oraesia* Guenée in Boisduval & Guenée, 1852			
Oraesia emarginata Fabricius, 1794	49	34	83

Table 3. *Continued.*

Taxon	No. of individuals		
	M	F	Total
Tribe Ophiderini Guenée, 1852			
Genus *Eudocima* Billberg, 1820			
Eudocima materna (Linnaeus, 1767)	33	23	56
Eudocima phalonia (Linnaeus, 1766)	42	16	58
Eudocima sikhimensis (Butler, 1895)	23	11	34
Eudocima homanea (Hübner, [1823])	21	17	38
Eudocima salaminia (Cramer, 1777)	22	14	36
Eudocima aurantia Moore, 1877	8	6	14
Eudocima cajeta (Cramer, 1779)	3	7	10
Eudocima hypermnestra (Stoll, 1780)	13	8	21
Eudocima cocalus (Cramer, 1777)	11	5	16
Tribe Phyllodini Guenée, 1852			
Genus *Phyllodes* Boisduval, 1832			
Phyllodes consobrina Westwood, 1848	2	-	2
Genus *Ramadasa* Moore, 1877			
Ramadasa pavo (Walker, 1856)	19	14	33
Genus *Savara* Walker, 1862			
Savara pallidapex Holloway, 2005*	-	1	1
Subfamily Hypocalinae Guenée, 1852			
Tribe Hypocalini Guenée, 1852			
Genus *Hypocala* Guenée, 1852			
Hypocala deflorata (Fabricius, 1794)	67	41	108
Hypocala biarcuata Walker, 1858	48	23	71
Hypocala rostrata (Fabricius,1794)	31	24	55
Hypocala guttiventris (Walker [1858])	9	16	25
Hypocala subsatura (Guenée, 1852)	15	12	27
Hypocala violacea (Butler, 1879)	36	123	159
Subfamily Tinoliinae			
Tribe Tinoliini Moore, [1885]			
Genus *Calesia* Guenée, 1852			
Calesia stillifera Felder & Rogenhofer, 1874	16	5	21
Subfamily Erebinae Leach, [1815]			
Tribe Toxocampini Guenée, 1852			
Genus *Lygephila* Billberg, 1821			
Lygephila dorsigera (Walker, 1865)	13	7	20
Tribe Acantholipini Fibiger & Lafontaine, 2005			
Genus *Hypospila* Guenée, 1852			
Hypospila bolinoides Guenée, 1852	6	9	15
Tribe Erebini Leach, [1815]			
Genus *Erebus* Latreille, 1810			
Erebus macrops (Linnaeus, 1768)	43	15	58
Erebus ephesperis (Hübner, [1823])	12	5	17
Erebus hieroglyphica (Drury, 1773)	17	8	25
Genus *Lygniodes* Guenée, 1890			
Lygniodes schoenbergi Pagenstcher, 1890	6	-	6
Lygniodes reducens Fabricius, 1794	4	1	5
Lygniodes hypoleuca Guenée, 1852	9	2	11
Genus *Sympis* Guenée, 1852			
Sympis rufibasis Guenée, 1852	5	3	8
Tribe Catocalini Boisduval, [1828]			
Genus *Ulotrichopus* Wallengren, 1860			
Ulotrichopus macula Hampson, 1891	46	10	56
Ulotrichopus sp.	2	-	2
Tribe Cocytiini			
Genus *Serrodes* Guenée, 1852			
Serrodes campana Guenée, 1852	39	35	74
Serrodes mediopallens Prout,1924	12	3	15
Genus *Avatha* Walker, 1858			
Avatha noctuoides (Guenée,1852)	53	19	72
Avatha bubo (Geyer, 1832)	4	2	6
Tribe Euclidiini Guenée, 1852			
Genus *Trigonodes* Guenée, 1852			
Trigonodes hyppasia (Cramer, 1779)	8	10	18
Genus *Mocis* Hübner, 1823			
Mocis frugalis (Fabricius, 1775)	48	20	68
Mocis undata (Fabricius, 1775)	39	14	53
Tribe Ercheiini Berio, 1992			
Genus *Ercheia* Walker, [1858]			
Ercheia cyllaria (Cramer, 1779)	68	18	86
Ercheia niveostrigata Warren, 1930	2	6	8
Tribe Pandesmini			
Genus *Pandesma* Guenée in Boisduval & Guenée, 1852			
Pandesma quanavadi Guenée, 1852	45	23	68
Genus *Ortopla* Walker, 1859			
Ortopla lindsayi (Hampson, 1891)	40	11	51
Ortopla boarmoides Guenée, 1852	34	22	56
Tribe Hulodini			
Genus *Lacera* Guenée, 1852			
Lacera noctilio (Fabricius, 1794)	219	162	381
Genus *Hulodes* Guenée, 1858			
Hulodes caranea (Cramer, 1780)	45	23	68
Genus *Ericeia* Walker, (1858)			
Ericeia inangulata (Guenée, 1852)	19	24	43
Ericeia eriophora (Guenée, 1852)	6	12	18
Ericeia korintijiens Prout 1928	13	26	39
Tribe Ophiusini Guenée, 1837			
Genus *Ophiusa* Hüber, 1806			
Ophiusa olista (Swinhoe,1893)	20	11	31
Ophiusa trapezium (Guenée, 1852)	24	17	41
Ophiusa discriminans (Walker, 1858)	19	12	31
Ophiusa triphaenoides (Walker, 1858)	28	16	44
Ophiusa tirhaca (Cramer, 1777)	14	9	23
Genus *Artena* Walker, 1858			
Artena inversa (Walker, 1858)	3	6	9
Artena dotata (Fabricius, 1794)	53	37	90
Genus *Hamodes* Guenée, 1852			
Hamodes propitia (Boisduval, 1832)	3	1	4
Genus *Thyas* Fabricius, 1775			
Thyas coronata (Fabricius, 1775)	52	37	89
Thyas juno (Dalman, 1823)	5	3	8
Tribe Poaphilini Guenée, 1852			
Genus *Achaea* Hübner, 1833			
Achaea janata (Linnaeus, 1758)	186	108	294
Achaea serva (Fabricius, 1775)	67	35	102
Achaea mezentia (Stoll, 1780)	32	15	47
Subtribe Dysgonidae Moore, 1885			
Genus *Parallelia* Hübner, 1818			
Parallelia rigidistria (Guenée, 1852)	6	3	9
Genus *Dysgonia* (Hübner, 1823)			
Dysgonia maturata Walker, 1858	3	8	11
Genus *Bastilla* Swinhoe, 1918			
Bastilla crameri (Moore, [1885])	8	3	11
Bastilla joviana (Stoll, 1782)	1	4	5
Bastilla amygdalis Moore, [1885]	34	27	61
Bastilla stuposa Fabricius, 1794	9	6	15
Bastilla absentimacula (Guenée, 1852)	11	7	18
Genus *Pindara* Moore, [1885]			
Pindara illibata (Fabricius, 1775)	39	16	55
Genus *Grammodes* Guenée, 1852			
Grammodes geometrica (Fabricius, 1775)	26	17	43

Table 3. *Continued.*

Taxon	No. of individuals		
	M	F	Total
Genus *Chalciope* Hübner, 1806			
Chalciope mygdon (Cramer, 1777)	23	10	33
Genus *Oxyodes* Guenée, 1852			
Oxyodes scrobiculata (Fabricius,1775)	733	693	1426
Tribe Catephiini			
Genus *Nagia* Walker, 1858			
Nagia linteola (Guenée, 1852)	3	6	9
Tribe Hypopyrini			
Genus *Spirama* Guenée, 1852			
Spirama retorta (Clerck, 1759)	81	-	81
Spirama helicina (Hübner, 1831)	-	62	62
Genus *Hypopyra* Guenée, 1852			
Hypopyra vespertilio (Fabricius, 1775)	7	5	12
Genus *Speiredonia* Hübner, [1823]			
Speiredonia mutabilis (Fabricius, 1794)	8	7	15
Speiredonia alix Guenée, 1852	10	13	23
Tribe Ommatophoridae Guenée, 1852			
Genus *Ommatophora* Guenée, 1852			
Ommatophora sp.	2	14	16
Genus *Dinumma* Walker, 1858			
Dinumma sp.	1	4	5
Genus *Anticarsia* Hübner, 1818			
Anticarsia irrorata (Fabricius, 1781)	4	11	15
Genus *Chrysopera* Hampson, 1894			
Chrysopera combinans (Walker, 1858)	43	18	61
Genus *Pericyma* Herrich-Schäffer, 1851			
Pericyma glaucinans (Guenée, 1852)	24	15	39
Genus *Anisoneura* Guenée, 1852			
Anisoneura aluco (Fabricius, 1775)	3	7	10
Genus *Platyja* Hübner, [1823]			
Platyja umminia (Cramer, 1780)	3	1	4
Genus *Chilkasa* Swinhoe, 1885			
Chilkasa falcata Swinhoe, 1885	15	3	18
Subfamily Herminiinae Herrich-Schäffer, 1845			
Genus *Simplicia* Guenée, 1854			
Simplicia robustalis Guenée, 1854	10	6	16
Genus *Hydrillodes* Guenée, 1854			
Hydrillodes abavalis (Walker, [1859])	4	3	7
Genus *Hyblaea* Fabricius, 1794			
Hyblaea puera Cramer, 1797	48	25	73
Subfamily Hypeninae Herrich-Schäffer, 1845			
Genus *Hypena* Schrank, 1802			
Hypena rectilinea Moore, 1879	6	4	10
Hypena lividalis Hübner, 1796	3	6	9
Hypena occata Moore, 1882	3	3	6
Hypena elongalis Fabricius, 1794	5	4	9
Hypena sagitta (Fabricius, 1775)	18	15	33
Hypena pullata (Moore, [1885])	9	12	21
Hypena sp. 1	1	3	4
Hypena sp. 2	2	4	6
Subfamily Focillinae			
Genus *Mecodina* Guenée, 1852			
Mecodina praecipua (Walker, 1865)	7	9	16
Genus *Avitta* Walker, 1852			
Avitta quardrillinea Walker, [1863]	43	21	64
Erebinae unplaced to tribe			
Genus *Ischyja* Hübner, 1818			
Ischyja manlia (Cramer, 1766)	34	12	46
Ischyja hemiphaea (Hampson, 1926)	5	7	12
Genus *Sphingomorpha* Guenée, 1852			
Sphingomorpha chlorea Cramer, 1777	74	38	112
Genus *Psimada* Walker, 1858	-	2	2
Psimada quadripennis Walker, 1858			
Erebidae unplaced to subfamily			
Genus *Hyperlopha* Hampson, 1895			
Hyperlopha cristifera (Walker, 1865)	4	-	4
Family Euteliidae Grote, 1882			
Subfamily Euteliinae, Grote, 1882			
Genus *Eutelia* Hübner, 1818			
Eutelia dicistriga Walker, 1865	2	7	9
Eutelia adulatricoides (Mell, 1943)	51	33	84
Genus *Penicillaria* Guenée, 1852			
Penicillaria jocosatrix Guenée, 1852	17	9	26
Penicillaria maculata Butler, 1889	3	9	12
Penicillaria sp. 1	2	5	7
Penicillaria sp. 2	2	2	4
Genus *Targalla* Walker, [1858]			
Targalla atripars (Hampson, 1912)	9	8	17
Targalla delatrix Guenée, 1879	9	5	14
Genus *Paectes* Hübner, 1818			
Paectes cristatrix (Guenée, 1852)	21	7	28
Subfamily Pangraptinae Grote, 1882			
Genus *Lopharthrum* Hampson, 1894			
Lopharthrum comprimens (Hampson, 1894)	7	13	20
Subfamily Gonopterinae			
Genus *Carea* Walker, 1856			
Carea obsolescens Moore, 1884	6	7	13
Subfamily Eublemminae Forbes, 1954			
Genus *Eublemma* Hübner, 1829			
Eublemma parva (Hübner, [1808])	2	2	4
Subfamily Pantheinae Smith, 1898			
Genus *Trichosea* Grote, 1875			
Trichosea champa (Moore, 1879)	19	8	27
Subfamily Aganainae			
Genus *Asota* Hübner, [1819]			
Asota caricae (Fabricius, 1775)	17	22	39
Family Nolidae Bruand, 1846			
Genus *Westermannia* Hübner, [1821]			
Westermannia superba Hübner, 1823	14	5	19
Westermannia argentea Hampson, 1891	3	2	5
Genus *Callyna* Guenée, 1852			
Callyna costiplaga Moore, [1885]	26	12	38
Subfamily Sarrothripinae Hampson, 1894			
Genus *Blenina* Walker, 1857			
Blenina quinaria Moore, 1882	22	12	34
Blenina angulipennis (Moore, 1882)	13	11	24
Blenina sp. 1	16	5	21
Blenina sp. 2	2	7	9
Blenina sp. 3	5	18	23
Genus *Eligma* Hübner, 1819			
Eligma narcissus (Cramer, 1775)	1	-	1
Subfamily Risobinae Mell, 1943			
Genus *Risoba* Moore, 1881			
Risoba obstructa Moore, 1881	6	7	13
Risoba sp.	6	10	16
Subfamily Stictopterinae Hampson, 1894			
Genus *Pterogonia* Swinhoe, 1891			
Pterogonia episcopalis Swinhoe, 1891	1	2	3
Pterogonia nubes (Hampson, 1893)	3	6	9
Total	5242	3853	9095



Figures 3–8. Noctuoid moths of Western Ghats. **3.** *Hypocala deflorata* (Hypocalinae). **4.** *Hypocala subsatura* (Hypocalinae). **5.** *Hypocala guttiventris* (Hypocalinae). **6.** *Hypocala violacea* (Hypocalinae). **7.** *Mocis frugalis* (Erebinae). **8.** *Mocis undata* (Erebinae).

Material examined. Table 3.

Remarks. *Anomis mesogona* was revised as *Gonitis mesogona* by Holloway (2005). Hampson distinguished this species by the excised forewing at the outer margin up to vein M3, where it is produced. There are 2 black spots at end of the forewing's cell.

Rusicada privata (Walker, 1865)

Gonitis commoda Butler 1878: 203.
Rusicada subfulvida Warren 1913: 360.
Rusicada griseolineata Warren 1913: 360.
Anomis fulvida Guenée 1852: 397—Moore 1882: 155.

Material examined. Table 3; Figure 10.

Remarks. *Anomis privata* (Walker, 1865) was revised as *Rusicada privata* by Holloway (2005). *Anomis commoda* was synonymized with *Anomis privata* by Sugi et al. (1992). Forewing with a wavy postmedial line from the costa to vein M2, curved to lower angle of the cell and wavy to inner margin. In male genitalia, the uncus is stout, curved, and broadly sword-shaped.

Anomis flava (Fabricius, 1775)

Noctua stigmatizans Fabricius 1775: 601.
Xanthia fimbriago Stephens 1829: 67.
Cosmophila xanthindyma Boisduval 1833: 242.
Cosmophila auragoides Guenée 1852: 397.
Cosmophila indica Guenée 1852: 396.
Cirroedia variolosa Walker,1857: 150.
Cirroedia edentata Walker,1857: 150.
Cosmophila aurantiaca Prittwitz 1867: 277.
Anomis serrata Barnes & McDunnough 1913: 169.

Material examined. Table 3.

Remarks. *Cosmophila auragoides* is a synonym of *Anomis flava* according to Poole (1989). It is smaller than other *Anomis* species. Forewing with a large reniform spot at end of the cell.

Figures 9–14. Noctuoid moths of Western Ghats. **9.** *Gonitis involuta* (Erebinae). **10.** *Rusicada privata* (Erebinae). **11.** *Pindara illibata* (Erebinae). **12.** *Chilkasa falcata* (Erebinae).**13.** *Achaea mezentia* (Erebinae). **14.** *Avatha noctuoides* (Erebinae).

***Gonitis involuta* (Walker, [1858])**

Gonitis involuta Walker [1858]:1003.
Gonitis basalis Walker [1858]: 1004.
Tiridata colligata Walker 1857: 870.
Gonitis vitiensis Butler 1886: 408.
Gonitis basalis Butler 1886: 408.
Cosmophila dona Swinhoe 1919: 313.
Anomis brima Swinhoe 1920: 255.

Material examined. Table 3; Figure 9

Remarks. *Gonitis involuta* was revised by Holloway (2005). This species is distinguished from other *Gonitis* species by its small and diffused forewings markings.

***Eudocima materna* (Linnaeus, 1767)**

Noctua hybrida Fabricius 1775: 593.
Ophideres apta Walker 1858: 1221.
Ophideres chalcogramma Walker 1865: 937.

Material examined. Table 3; Figures 25, 26.

Remarks. This is an Old World species. The diagnostic features of *E. materna* are as follows: forewing with 3 rufous spots at end of the cell in both sexes. Hindwing with a black spot on the costa.

***Eudocima phalonia* (Linnaeus, 1763)**

Phalaena (*Noctua*) *phalonia* Linnaeus 1763: 28.
Phalaena fullonia Clerck [1764]: 48.
Phalaena (*Attacus*) *fullonica* Linnaeus 1767: 812.
Noctua dioscoreae Fabricius 1775: 593.
Phalaena (*Noctua*) *pomona* Cramer [1775]: 122.
Ophideres princeps Boisduval 1832: 245.
Ophideres obliterans Walker 1857: 1229.
Othreis fullonia Clerck—Holloway 1976: 36.

Material examined. Table 3.

Remarks. *Eudocima phalonia* is a senior synonym of *E. fullonia* reinstated by Zill and Hogenes (2002). The species name *E. fullonia* was misspelled as *E. fullonica* by Linnaeus, 1767. Sexes are dimorphic. Males with usually lineated forewings and females with much more variable

Figures 15–20. Noctuoid moths of Western Ghats. **15.** *Lygniodes schosenbergi* (Erebinae). **16.** *Nagia linteola* (Erebinae). **17**. *Oraesia emarginata* (Calpinae). **18.** *Ischyja manlia*. **19.** *Erebus macrops* (Erebinae). **20.** *Erebus hieroglyphica* (Erebinae).

marks and red-brown specks. Female is having the triangular white mark usually present on the postmedial line.

Eudocima sikhimensis (Butler, 1895)

Adris sikhimensis Butler 1895: 1260.

Othreis abathyglypta Prout 1928: 264.

Material examined. Table 3; Figures 29, 30.

Remarks. *Othreis abathyglypta* was synonymized with *Eudocima sikhimensis* by Banziger (1985). A strongly sexually dimorphic species. The forewings resembles a green leaf and apex produced; an oblique black midrib line running from centre of the dorsum to the apex.

Eudocima homanea (Hübner, [1823])

Othreis homaena Hübner [1827]: 264.

Phalaena (*Noctua*) *ancilla* Cramer 1777: 84.

Phalaena strigata Donovan, [1804]:54

Ophideres bilineosa Walker [1858]: 1227.

Othreis ancilla formosana Okano 1964: 43.

Othreis homaena Hübner—Holloway 1976: 36.

Material examined. Table 3; Figure 27, 28

Remarks. This is an oriental zone species with sexual dimorphism pattern in forewing. Male with forewing is having a variegated and transversely rippled purplish brown, with a sigmoid postmedial and straight antemedial and female with similar ground colour.

Eudocima salaminia (Cramer, 1777)

Noctua salaminia Cramer [1777]: 117.

Eudocima salaminia Cramer- Holloway 1976: 36.

Material examined. Table 3; Figure 24

Remarks. This species was recorded from Oriental region by Hampson (1894). The diagnostic characters of the species: forewing is suffused golden green colour; the hindwing with black border and narrow.

Figures 21–26. Noctuoid moths of Western Ghats. **21.** *Ophiusa triphaenoides* (Erebinae). **22.** *Ophiusa discriminans* (Erebinae). **23.** *Ophiusa tirhaca* (Erebinae). **24.** *Eudocima salaminia* (Calpinae). **25.** *Eudocima materna* ♀ (Calpinae). **26.** *Eudocima materna* ♂ (Calpinae).

***Eudocima aurantia* (Moore, 1877)**

Adris rutilus Moore 1881: 700.

Material examined. Table 3; Figure 31

Remarks. It can be identified on the forewing colour as browner with dark striae slight purple brown. Hindwing orange much broad, with a large black lunule beyond lower angle of the forewing's cell.

***Eudocima cajeta* (Cramer, 1779)**

Ophideres multiscripta Walker 1857: 1226.

Material examined. Table 3; Figure 32

Remarks. Classification adapted from Kononenko and Pinratana (2005). Two light in colour antemedial and medial lines of the forewing.

***Eudocima hypermnestra* (Stoll, 1780)**

Material examined. Table 3.

Remarks. It can be differentiated from the other species based on hindwing with a black spot at lower angle of the cell and another one above anal angle.

***Eudocima cocalus* (Cramer, 1777)**

Material examined. Table 3.

Remarks. This species differs from *E. hypermnestra* in not having black spot on hindwing, the black marginal band with nearly even inner edge and extending to anal angle.

***Phyllodes consobrina* Westwood, 1848**

Phyllodes perspicillator Guenée 1852: 120.

Phyllodes maligera Butler 1883: 138.

Phyllodes roseigera Butler 1883: 164.

Material examined. Table 3; Figure 38

Remarks. *P. perpicillator, P. maligera,* and *P. roseigera* were synonymized with *P. consobrina.* It was described from oriental region. This species can be easily differentiated from *P. eyndhovii* based on forewings and

Figures 27–32. Noctuoid moths of Western Ghats. **27.** *Eudocima homaena* ♂ (Calpinae). **28.** *Eudocima homaena* ♀ (Calpinae). **29.** *Eudocima sikhimensis* ♀ (Calpinae). **30.** *Eudocima sikhimensis* ♂ (Calpinae). **31.** *Eudocima aurantia* (Calpinae). **32.** *Eudocima cajeta* (Calpinae).

hind wings patterns. Forewing with an S-shaped brown mark on discocellulars. Hindwing with a large crimson patch with white centre at anal angle.

***Ramadasa pavo* (Walker, 1856)**

Chasmina pavo Walker 1856: 147

Material examined. Table 3; Figure 37

Remarks. Forewing with costa is having five blue-black spots and oblique medial line vinous suffusion on its outer edge. A black striga from costa to the reniform and a blue-black beyond it from the costa to vein 6 where it is bent outwards to the margin as a streak.

***Savara pallidapex* Holloway, 2005**

Material examined. Table 3; Figure 40

Remarks. This species was described as a new species by Holloway (2005) from Borneo. This species also occurs in N.E. Himalaya and New Guinea. A voucher specimen is in the USNM. We have recorded as new in Western Ghats Tamil Nadu, India.

***Hypocala deflorata* (Fabricius, 1794)**

Hypocala angulipalpis Guenée 1852: 75.

Hypocala moorei Butler 1892: 21.

Hypocala australiae Butler 1892: 21.

Material examined. Table 3; Figure 3

Remarks. The listing of the name is valid based on Holloway (2005) and Kononenko and Pinratana (2005) classifications. This species differs from *Hypocala subsatura* based on the head, thorax and forewing paler colour. Hindwing with larger orange area.

***Hypocala biarcuata* Walker, 1858**

Material examined. Table 3.

Remarks. This species can be differentiated from other species based on the forewing and hind wing

Figures 33–38. Noctuoid moths of Western Ghats. **33.** *Hypopyra vespertilio* (Erebinae). **34.** *Artena dotata* (Erebinae). **35.** *Bastilla joviana* (Erebinae). **36.** *Bastilla crameri* (Erebinae). **37.** *Ramadasa pavo* (Erebinae). **38.** *Phyllodes consobrina* (Erebinae).

markings. Forewing with a submarginal black line in the form of two curves touching the margin at apex, centre and outer angle. Hindwing orange with marginal black band broad at costa and narrowing to anal angle.

***Hypocala rostrata* (Fabricius, 1794)**

Hyblaea plumicornis Guenée, 1852: 75.
Hyblaea efflorescens Guenée, 1852: 77.
Hyblaea genuiai Wallengren, 1856: 66.
Hyblaea bohemani Wallengren, 1856: 67.

Material examined. Table 3.

Remarks. This species was superficially similar to *H. subsatura*. It can be distinguished by head and thorax being paler. Hindwing orange not conjoined to a large spot in end of cell and with marginal orange spot near anal angle.

***Hypocala guttiventris* (Walker, [1858])**

Hypocala lattivitta Walker 1865: 929.
Hypocala triphaenina Felder & Rogenhofer, 1874: 20.

Material examined. Table 3; Figure 5

Remarks. This species differs from *H. biarcuata* and synonym of *H. lattivitta*. The forewing is darker with large patches of grey suffusion on inner area and on costa before apex. Hindwing with a black cell-spot prominent on underside. The male genitalia with uncus broad fringed with hairs composed of a curved terminal lobe and having a subapical beak-like part.

***Hypocala subsatura* (Guenée, 1852)**

Hypocala aspera Butler, 1883: 164.
Hypocala limbata Butler, 1889: 76 .

Material examined. Table 3; Figure 4

Remarks. The classification was followed based on

Figures 39–44. Noctuoid moths of Western Ghats. **39.** *Hyperlopha cristifera*. **40.** *Savara pallidapex* (Erebinae). **41.** *Ortopla boarmoides* (Erebinae). **42.** *Ortopla lindsayi* (Euteliinae). **43.** *Sphingomorpha chlorea*. **44.** *Serrodes campana* (Erebinae).

Holloway (2005) and Kononenko and Pinratana (2005). The species occurs in Oriental region to Sundaland, the forewings are variable and with a distinct form that has an undulating red-brown border to the dorsum.

Hypocala violacea (Butler, 1879)

Hypocala violacea Butler 1879: 6—Holloway, 1976: 35.
Hypocala clarissima Butler 1892: 21.
Hypocala kebeae Bethune-Baker 1906: 249.

Material examined. Table 3; Figure 6

Remarks. This species differs from *H. subsatura* its forewings which are uniform rufous and violet brown irrorated with dark specks. The forewing underside with black markings are reduced. The hindwing underside is broadly pale brown over the anterior half, with dark striae.

Erebus macrops (Linnaeus, 1768)

Noctua bubo Fabricius 1775: 591.
Patula boopis Guenée,1852: 178.

Material examined. Table 3; Figure 19

Remarks. The identification was followed by Holloway (2005). It can be distinguished from other species of group by its fulvous ocellus mark of the forewing which is very large and it is surrounded distally by three blue streaks and specks on it.

Erebus ephesperis (Hübner, [1823])

Nyctipao laetitia Butler 1879: 9.
Erebus niasana Swinhoe 1918: 85.
Erebus malanga Swinhoe 1918: 86.

Material examined. Table 3.

Remarks. This species sexes are limited different, both sexes having an equally mottled brown pattern to the wings. However the males tend to be somewhat more intensely variegated with a deep buff distal edging to the medial line.

Figures 45–50. Noctuoid moths of Western Ghats. **45.** *Chrysopera combinans* (Erebinae). **46.** *Avitta quardrilinea* (Focillinae). **47.** *Westermannia superba* (Nolinae). **48.** *Chasmina candida* (Bagisarinae). **49.** *Callyna costiplaga* (Palindinae). **50**. *Trichosea champa* (Pantheinae).

***Erebus hieroglyphica* (Drury, 1773)**

Noctua harmonia Cramer [1777]: 119.
Noctua mygdonia Cramer [1777]: 119.
Noctua ulula Fabricius 1781: 211.
Bocana lunaris Walker 1866: 57.
Argiva hieroglyphica celebensis Hopffer 1874: 46.
Nyctipao hieroglyphica tenebrata Prout 1919: 170.

Material examined. Table 3.

Remarks. This species shows a strong sexual dimorphism. In male species both hindwing are reduced. Female forewing with oblique white bar on sub costal, a postmedial whitish band on forewing above vein 3.

***Avatha noctuoides* (Guenée, 1852)**

Hypaetra noctuoides Guenée 1852: 259.
Athyrma ptocha Prout 1925: 402.

Material examined. Table 3; Figure 14

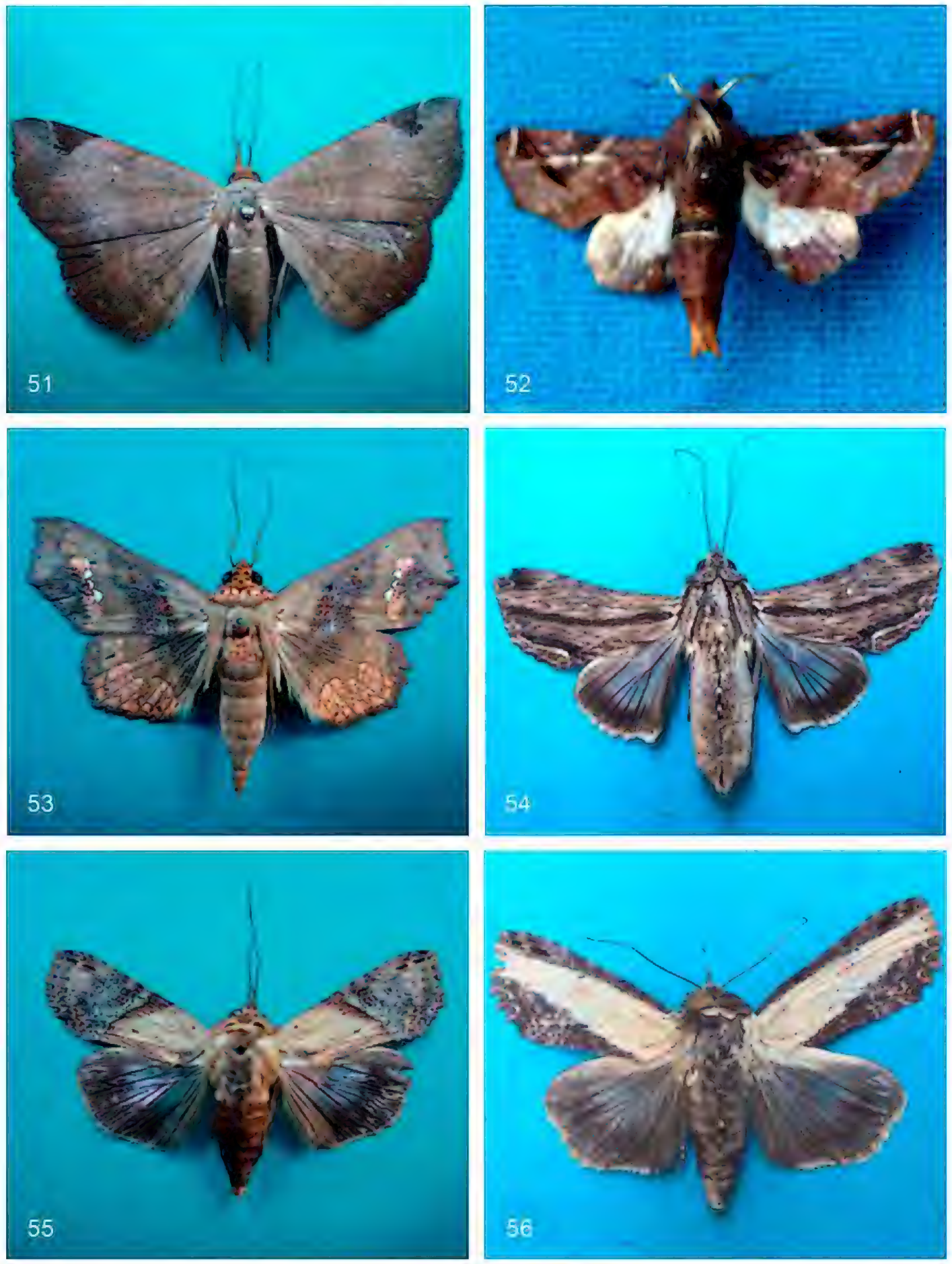
Remarks. This species is often mistaken for a form of *Avatha discolor*. *Athyrma ptocha* is a new synonym of *A. noctuoides* of Holloway (2005). Antemedial black area subdorsally connected with smaller black flecks on the costa of the forewing.

***Mocis frugalis* (Fabricius, 1775)**

Noctua frugalis Fabricius 1775: 601.
Chalciope lycopodia Geyer 1837: 25.
Remigia translata Walker 1865: 1015.
Remigia nigripunctata Warren 1913: 333.
Mocis frugalis Fabricius—Holloway 1976: 31; Kobes 1985: 49.

Material examined. Table 3; Figure 7

Remarks. This taxon was treated as two distinct species: Afrotropical *M. proverai* Zilli (2000); Indo-Australian *M. frugalis* and recognized the old concept of *M. frugalis* by Zilli (200b). The pale ochreous brown colour of both wings similar in *Trigonodes hyppasia* whereas lacking the black triangles. Male genitalia with uncus broad, harpe well developed.



Figures 51–56. Noctuoid moths of Western Ghats. **51.** *Macodina pracipua* (Focilinae). **52.** *Penicillaria jocosatrix* (Euteliinae). **53.** *Lopharthrum comprimens* (Focillinae). **54.** *Aegila describens* (Stictopterinae). **55.** *Stictoptera signifera* (Stictopterinae). **56.** *Stictoptera cuculloides* (Stictopterinae).

***Mocis undata* (Fabricius, 1775)**

Noctua undata Fabricius 1775: 600.
Phalaena archesia Cramer [1780]: 145.
Phalaena virbia Cramer [1780]: 146.
Remigia gregalis Guenée 1852: 320.
Ophisma velata Walker [1863]: 180.
Remigia bifasciata Walker 1865: 1014.
Cauninda bifasciata Warren 1913: 333.
Mocis undata Fabricius—Holloway 1976: 31; Kobes, 1985: 48.

Material examined. Table 3; Figure 8

Remarks. Forewing with anal of the antemedial containing a black spot in males. On the basis of variability in genital characters differ from *M. frugalis* based on male genitalia with uncus short and slender and harpe is not well developed.

***Ortopla lindsayi* (Hampson, 1891)**

Material examined. Table 3; Figure 42

Remarks. The species can be differentiated by male genitalia dissection. The uncus was short apically bifurcated. Valvae symmetrical in *Polydesma boarmoides.* Forewing with subbasal and antemedial lines are blackish.

***Ortopla boarmoides* Guenée, 1852**

Polydesma boarmoides Guenée 1852: 441.
Polydesma mastrucata Felder & Rogenhofer 1874: 111.

Material examined. Table 3; Figure 41

Remarks. This species is distinguished from *Ortopla lindsayi* based on male genitalia; the uncus was long and slender. Symmetrical of valve shape, the corona long and well developed sword-like.

***Ophiusa trapezium* (Guenée, 1852)**

Ophisma circumferens Walker 1865: 956.
Ophisma cognata Walker 1865: 958.
Ophiodes adusta Moore 1882: 169.

Ophiusa kebea Bethune-Baker 1906: 255.
Ophiusa trapezium Guenée—Kobes, 1985: 35.

Material examined. Table 3.

Remarks. Forewing fuscous grey irrorated with dark scales. A double prominent straight submarginal line and the area beyond it reddish suffused with purple with a dentate marginal line.

Ophiusa discriminans (Walker, 1858)

Anua pygospila Snellen 1880: 98.
Anua intacta Hampson 1913: 437.
Anua discriminans Walker—Holloway 1976: 29.

Material examined. Table 3; Figure 22

Remarks. This species is similar to *Ophiusa disjungens* but abdomen orange with a black dorsal patch near extremity. Hindwing with black band broad in *O. disjungens* and narrow in *O. discriminans*.

Ophiusa triphaenoides (Walker, 1858)

Ophiodes cuprea Moore, 1867: 74.
Ophiusa triphaenoides Walker—Kobes, 1985: 36.

Remarks. Material examined. Table 3; Figure 21

This species is similar to *Ophiusa trapezium* but smaller. Forewing with submarginal sinuous line pale angled outwards at vein 6, the angle filled in with black and with black above it.

Ophiusa tirhaca (Cramer, 1777)

Noctua tirrhaea Fabricius 1781: 213.
Phalaena Noctua vesta Esper 1789: 445.
Noctua olivacea de Villers 1789: 65.
Noctua auricularis Hubner [1803]: 321.
Ophiodes hottentota Guenée 1852: 229.

Material examined. Table 3; Figure 23

Remarks. Forewing is greenish yellow and reniform brown. An irregularly dentate submarginal line with two black subapical lunules on it.

Artena dotata (Fabricius, 1794)

Noctua dotata Fabricius 1794: 55.
Artena dotata Fabricius—Holloway, 1976: 29.

Material examined. Table 3; Figure 34

Remarks. This species was described from India, Sri Lanka and Burma. Forewing is having oblique postmedial and antemedial lines. Hindwing with a blue band in the center is strongly curved compared to other species.

Thyas coronata (Fabricius, 1775)

Noctua leonina Fabricius 1775: 596.
Noctua ancilla Fabricius 1794: 17.
Corycia magica Hübner 1827: 32.
Ophiusa coronata Fabricius—Kobes, 1985: 36.

Material examined. Table 3.

Remarks. This species is transferred to genus *Thyas* by Holloway (2005). This species can be easily distinguish by its yellow hind wings with two black bands and black tinged yellow abdomen. Forewing is having reniform black or obscure.

Thyas juno (Dalman, 1823)

Ophideres elegans Hoeven 1840: 280.
Lagoptera multicolor Guenée 1852: 226.
Thyas bella Bremer & Grey 1853: 66.
Dermaleipa juno f. *renalis* Bryk 1948: 120.

Material examined. Table 3.

Remarks. This species is unique with crimson colour abdomen and hind wings. There is a submarginal broad black area.

Achaea janata (Linnaeus, 1758)

Noctua melicerta Drury [1773]: 46.
Noctua tigrina Fabricius 1781: 218.
Catocala traversii Fereday 1877: 457.
Ophiusa ekeikei Bethune-Baker 1906: 256.
Achaea janata Linnaeus—Kobes, 1985: 39.

Material examined. Table 3.

Remarks. This species is slightly smaller than *Achaea serva* and *Achaea mezentia.* Hindwing with white medial band broader. Male genital structure the uncus is long and sickle shaped and valvae symmetrical.

Achaea serva (Fabricius, 1775)

Noctua serva Fabricius 1775: 593.
Achaea fasciculipes Walker 1858: 1400.
Achaea serva fuscosuffusa Gaede 1938: 480.
Achaea serva Fabricius—Holloway 1976: 30, 1982: 235; Kobes 1985: 40.

Material examined. Table 3.

Remarks. This species forewing is usually more uniform pale brick-red, with marking indistinct. Male genitalia the uncus is broad not sickle shaped and valvae asymmetrical.

Achaea mezentia (Stoll, 1780)

Achaea reversa Walker,1858: 1399 .
Achaea lugens Walker 1865: 938.

Material examined. Table 3; Figure 13

Remarks. *Achaea reversa* is a synonym of *A. mezentia* according to Walker (1858). Hindwing is having black slightly shot with blue and with a large apical white patch.

Bastilla crameri (Moore, [1885])

Dysgonia crameri Moore 1885: 177.
Phalaena (*Noctua*) *achatina* Cramer [1780]: 171.
Dysgonia discalis Moore 1885: 177.
Parallelia crameri Moore—Kobes, 1985: 45.

Material examined. Table 3; Figure 36

Remarks. Morphologically is very complicated group. Forewing with postmedial line having the white band reduced to a line and being slightly outlined with purplish grey from the angle to inner margin.

Bastilla joviana (Stoll, 1782)

Noctua joviana Stoll 1782: 237.
Noctua sinuata Fabricius 1781: 507.
Parallelia joviana Stoll—Holloway 1976: 30.
Ophiusa myops Guenée 1852: 265.
Ophiusa affinis Guenée 1852: 265.

Material examined. Table 3; Figure 35

Remarks. This species slightly differs from *Bastilla arcuata.* Postmedial line with a wavy indented between the anal and inner margin and with some specks beyond it instead of dentate line.

Bastilla amygdalis Moore, [1885]

Dysgonia amygdalis Moore [1885] 1884–1887: 551.
Parallelia amygdalis Moore—Kobes, 1985: 93.

Material examined. Table 3.

Remarks. Forewing with an antemedial line curved outwards below the cell and the apical streak with its outer edge sinuation, having three white specks on the costa before apex.

***Bastilla absentimacula* (Guenée, 1852)**

Parallelia silvestris Strand 1920: 125.

Material examined. Table 3

Remarks. The forewing is much uniform in colour than *B. amygdalis* and *B. joviana*, and usually a violet brownish grey. The medial and postmedial lines are slightly darker and rather narrow, the peak in the postmedial at medial being rather thick.

***Pindara illibata* (Fabricius, 1775)**

Noctua illibata Fabricius 1775: 592.
Hemeroblemma peropaca Hübner 1825: 33.
Ophisma laetabilis Guenée 1852: 241.
Pindara illibata Fabricius—Holloway 1976: 30; Kobes 1985: 41.

Material examined. Table 3; Figure 11

Remarks. This taxon was reinstated as a valid species by Holloway (2005). A single species has been described from genus *Pindara*. The forewing has a large white edged semicircular, dark brown trapezoidal mark subapically at the costa.

***Chrysopera combinans* (Walker, 1858)**

Achaea combinans Walker 1857: 1399.
Achaea quadrilunata Pagenstecher 1890: 109.

Material examined. Table 3; Figure 45

Remarks. This name is original illustration because the species was synonymized with *Achaea quadrilunata.* The forewing has an apical ferruginous semicircular patch and hind wing having a large bright yellow apical patch.

***Chilkasa falcata* Swinhoe, 1885**

Pleurona perhamata Hampson 1894: 549.
Acygonia difformis Roepke 1948: 226.
Chilkasa falcata Swinhoe—Holloway, 1976: 38.

Material examined. Table 3; Figure 12

Remarks. The name is based on the description of the adult forewings. This species differs from *Pleurona falcata* based on morphology. The male forewing apex which is more produced and acute. Outer margin of hind wing is angled in the female, but not in the male.

***Hyperlopha cristifera* (Walker, 1865)**

Hyperlopha cristifera Walker sensu Holloway 1976: 38.

Material examined. Table 3; Figure 39

Remarks. This species resembles *Hyperlopha crucifera* in general fascia, even though is slightly larger. *H. crucifera* was described as a new species by Holloway (2005). He differentiated *H. cristifera* from *H. crucifera* based on the male genitalia. We have collected only female specimen of *H. cristifera.* More research is needed for this species.

Discussion

This study updates our knowledge of the moth fauna of the Western Ghats (Tamil Nadu, India) by providing new records of Noctuoidea. In India, exhaustive works on the Noctuidae were carried out by Hampson (1894) and Swinhoe (1885). Hampson (1894, 1895) included 166 species in his classic works. Recently, Francy (2000) recorded 163 species from Kerala.

In our study area, the Erebidae is the most species-rich family, with 106 species belonging to 6 subfamilies. The Noctuidae is the second-most species-rich family, with 51 species belonging to 9 subfamilies. *Oxyodes scrobiculata* and *Lacera noctilio* were the erebid species with most records in the Western Ghats. The possible occurrence of *Hyperlopha cristifera* in our study should be investigated because this is a species that is typical to Sri Lanka.

The superfamily Noctuoidea encompasses the families Oenosandridae, Notodontidae, Erebidae, Noctuidae, Euteliidae, and Nolidae. The Western Ghats in Tamil Nadu support a higher number of taxa belonging to the family Erebidae compared to a checklist of moths of the state of Maharastra, India (Sachin Gurule et al. 2011). This suggests that the Western Ghats in Tamil Nadu may favour high species diversity. This rich moth diversity in the Western Ghats highlights the need of protected areas, such as the Nilgiri Biosphere Reserve, in conserving the regional fauna.

Studies on the Noctuoidea of the southern part of the Western Ghats are very scanty. Given the variety of agro-forest ecosystems and environmental gradients found in the Western Ghats, we expect more species will be found with more fieldwork.

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Authors' Contributions

KS collected and identified the specimens, made the analysis, and wrote the text; PM and SA were associated with KS in collecting the specimens; SI oversaw the draft manuscript and supervised the work.

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